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MR3010166 (Review) 53A10
Morabito, Filippo (KR-KIAS-SM);
Rodríguez, M. Magdalena [Rodríguez Pérez, M. Magdalena] (E-GRAN-G)
Classification of rotational special Weingarten surfaces of minimal type in $\mathbb{S}^2 \times \mathbb{R}$ and $\mathbb{H}^2 \times \mathbb{R}$. (English summary)
Math. Z. **273** (2013), *no. 1-2,* 379–399.1432-1823

In the paper under review, the special Weingarten surfaces that are studied are surfaces for which there exists a function $f \in \mathcal{C}^1([0,+\infty))$ such that $H = f(H^2 - K_e)$, where H and K_e denote respectively the mean curvature and the extrinsic curvature of the surface and f satisfies $4x(f'(x))^2 < 1$ for any $x \geq 0$. These special Weingarten surfaces are called of minimal type if $f(0) = 0$.

The authors prove the necessary lemmas and propositions in order to establish two classification theorems of rotational special Weingarten surfaces of minimal type in $\mathbb{S}^2 \times \mathbb{R}$ and $\mathbb{H}^2 \times \mathbb{R}$. Summarized, these theorems state that:

- a complete rotational Weingarten surface of minimal type in $\mathbb{H}^2 \times \mathbb{R}$ is either a horizontal slice or a catenoidal type surface whose determining functions satisfy certain conditions;
- a complete rotational Weingarten surface of minimal type in $\mathbb{S}^2 \times \mathbb{R}$ is either a horizontal slice, or a vertical cylinder, or an unduloidal type surface whose determining functions satisfy certain conditions.

These results generalize several known theorems for minimal surfaces.

Also, the existence of non-complete examples of rotational special Weingarten surfaces of minimal type is shown.

Reviewed by *Wendy Goemans*

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